

REMARKS

This amendment is responsive to the Final Office Action dated June 4, 2008. Claims 1, 4-6, 12, and 13 have been amended and claim 7 has been cancelled. *No new matter has been added.* Support for these amendments may be found variously throughout the Specification, including page 23, paragraph 2 and page 24, paragraph 1 of the Substitute Specification. Claims 1-6 and 8-18 remain pending in the application. Applicant respectfully requests reconsideration of the pending claims in light of the following remarks.

Claims 1, 3-4, and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 4,913,525 to Asakura et al. ("Asakura") in view of U.S. Pat. No. 6,488,419 to Kato et al. ("Kato"). This rejection is traversed.

Claim 1 recites: *[a]n external cavity type semiconductor laser, comprising:*

a laser diode having a plurality of layers including an activation layer;

a window glass disposed opposite to a beam emission surface of the laser diode;

a grating that receives a beam emitted from the laser diode through the window glass and returns a beam having a predetermined wavelength to the laser diode; and

a lens disposed between the laser diode and the grating and which collects the beam emitted from the laser diode,

wherein the window glass is arranged in a first state or a second state,

wherein in the first state the window glass is nearly in parallel with a first axis and is not in parallel with a second axis,

wherein in the second state the window glass is not in parallel with the first axis, the window glass being nearly in parallel with the second axis,

wherein the first axis is nearly perpendicular to a surface that is in parallel with at least one of the boundary surfaces of the activation layer and other layers of the laser diode, and the second axis is nearly in parallel with the beam emission surface of the laser diode and nearly perpendicular to the first axis, and

wherein a reflectance of said beam emission surface of the laser diode is 3% or less for light received from outside the laser diode.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); *see also* MPEP 2143.03.

Asakura and Kato, either alone or in any permissible combination, fail to disclose or suggest the features of Applicant's claimed invention as recited in independent claim 1.

Specifically, Asakura and Kato, either alone or in any permissible combination, fail to disclose or suggest “[a]n external cavity type semiconductor laser, comprising: a laser diode... wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]”

Asakura discloses a frequency stabilized light source including a semiconductor laser chip, a lens, a finite Fourier diffraction grating and an anti-reflection coating. (Asakura, col. 3, lines 4-6.) A light beam coming out of one facet of the semiconductor laser chip is collimated by the lens, and is incident on the Fourier grating. (Asakura, col. 3, lines 6-9.) The incident light is dispersed depending on its wavelengths, and the light with a specific wavelength determined from the angle of the grating is fed back to the active layer of the semiconductor laser chip. (Asakura, col. 3, lines 9-13.) The semiconductor laser chip oscillates stably at the wavelength of the feedback light, and emits a frequency stabilized output light from the other facet thereof. (Asakura, col. 3, lines 13-16.) The output light from the semiconductor laser chip has its wavelength varied by the rotation of the grating. (Asakura, col. 3, lines 16-19.)

Although Asakura discloses an “anti-reflection coating 5 [] to enhance the coupling efficiency of the semiconductor laser chip 1 with the feedback light 16 from the grating” (Asakura, col 3, ll. 19-21), Asakura further discloses that “[i]n the case the oscillation is exerted in the vicinity of the gain center of the semiconductor laser chip 1, the anti-reflection coating is not always necessary.” (Asakura, col. 4, ll. 30-32, emphasis added.)

However, Asakura fails to disclose or suggest “[a]n external cavity type semiconductor laser, comprising: a laser diode... wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]”

Kato fails to cure the deficiencies of Asakura. Specifically, Kato fails to disclose or suggest “[a]n external cavity type semiconductor laser, comprising: a laser diode... wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]”

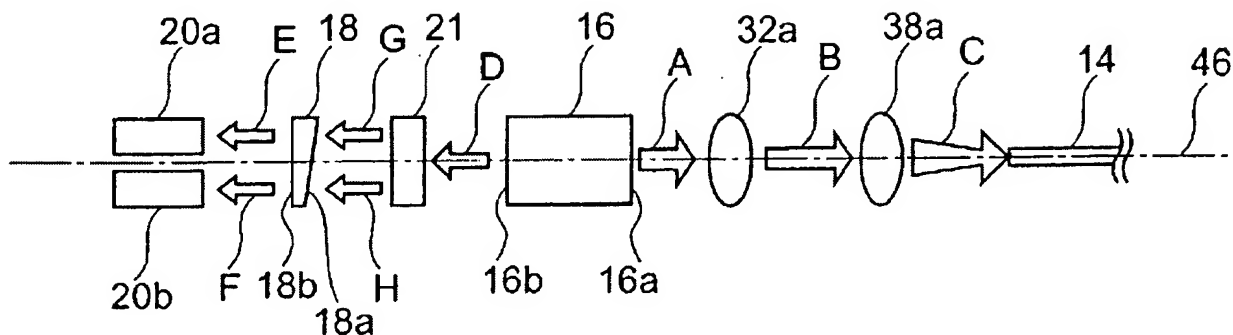
Kato discloses a light emitting module capable of adjusting the wavelength of light generated under operating conditions. (Kato, Abstract.) The light emitting module includes a semiconductor light emitting device 16, photodetectors 20a, 20b, and an etalon 18. (Kato, Abstract.) The semiconductor 16 has a light emitting surface 16a, a light reflecting surface 16b, and an active layer. (Kato, col. 16, lines 13-19.) The active layer is arranged between the light reflecting surface 16b and the light emitting surface 16a. (Kato, col. 8, lines 36-39.)

Photodetectors 20a, 20b are located so as to receive transmitted light from the first end face, light reflecting surface 16b of the semiconductor light emitting device. (Kato, Abstract.) The etalon 18 is located between the first end face 16b and the photodetector 20a, 20b. (Kato, Abstract.)

Kato discloses that “the optical fiber 14, lenses 32a, 38a, semiconductor laser 16, etalon 18, and photodetectors 20a, 20b are arranged in a direction of a predetermined axis 46 in the semiconductor laser module 1a.” (Kato, col. 15, lines 55-59.) The “semiconductor laser module 1a utilizes the output light from the back face of the semiconductor laser 16.” (Kato, col. 15, lines 59-60.) “This output light is spectroscopically split by use of the etalon 18 to obtain a plurality of monitor light including respective wavelength components having a predetermined wavelength spacing in the wavelength spectrum of the semiconductor laser 16.” (Kato, col. 15, lines 60-65.)

Figure 12A, reproduced below, is used by Kato to describe the propagation of light in the semiconductor laser module 1a. (Kato, col. 16, lines 6-8.)

Fig. 12A



Because Kato does not disclose light returning to the semiconductor laser device 16, Kato fails to disclose or suggest “[a]n external cavity type semiconductor laser, comprising: a laser diode... wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]”

Because even the combination of Asakura and Kato fail to yield the features of Applicants’ claimed invention, a *prima facie* case of obviousness cannot be maintained for independent claim 1.

If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Consequently, Claims 3, 4 and 11 which depend from claim 1, are patentable for their incorporation of the distinct features recited in claim 1, as well as their separately recited, patentably distinct features.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1, 3-4, and 11 under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato.

Claims 2 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, and further in view of U.S. Pat. No. 5,870,417 to Verdiell et al. (“Verdiell”). This rejection is traversed.

Claim 7 has been cancelled without prejudice. Accordingly, the rejection of this claim is

believed to be moot, and Applicants respectfully requests that this rejection also be withdrawn.

Applicants note that some features recited in amended claim 1 correspond to features previously recited in now cancelled claim 7, namely “wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]”

Verdiell discloses a waveguide DBR laser diode 12 having an exit facet 16 which “is antireflection coated.” (Verdiell, col. 4, ll. 11-13.) The Office Action relies on Verdiell for disclosing a reflectance coating “with 1% reflectance in order to suppress self oscillation.” (Office Action, p. 5, ll. 10-11.) However, reflectance is a directional property that is a function of the incident direction.

Thus, while Verdiell discloses an “[i]nternal reflection from AR exit facet 16 [] less than 1%,” Verdiell, like Asakura and Kato, fails to disclose or suggest “[a]n external cavity type semiconductor laser, comprising: a laser diode... wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]”

Claim 2, which depends from claim 1, is patentable for its incorporation of the distinct features recited in claim 1, as well as its separately recited, patentably distinct features.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, and further in view of Verdiell.

Claims 5, 6 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, and further in view of Mizuno et al., “100mW Kink-free Blue-violet Laser Diodes with Low Aspect Ratio,” Proceedings of the 11th Sony Research Forum, 2001 (“Mizuno”). This rejection is traversed.

Claims 5, 6 and 12 depend directly or indirectly from independent claim 1, and thus incorporate the features recited therein.

Asakura and Kato fail to disclose such features as described above. Mizuno is introduced as disclosing a blue laser diode and certain power features, but Mizuno does not address the above-described features of claim 1. Namely, Mizuno fails to disclose or suggest “[a]n external cavity

type semiconductor laser, comprising: a laser diode... wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]"

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 5, 6, and 12 under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, and further in view of Mizuon.

Claims 8-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, and further in view of U.S. Pat. No. 7,027,469 to Sidorin ("Sidorin"). This rejection is traversed.

Claims 8-10 depend from claim 1 and thus incorporate the features recited therein. As described above, Asakura and Kato fail to disclose these claimed features.

Sidorin is introduced for purported disclosures of the additional features recited in claims 8 and 10 regarding cavity length, but does not address and offers no remedy to the deficiencies of Asakura and Kato. Namely, Sidorin fails to disclose or suggest "[a]n external cavity type semiconductor laser, comprising: a laser diode... wherein a reflectance of [a] beam emission surface of the laser diode is 3% or less for light received from outside the laser diode[.]"

Thus even the combination of Asakura, Kato and Sidorin would still fail to yield the features of Applicant's claim 1, let alone dependent claims 8-10.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 8-10 under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, and further in view of Sidorin.

Claims 13-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, Mizuno, Verdiell and Sidorin. This rejection is traversed.

For reasons similar to those provided regarding claim 1 above, claim 13 is neither disclosed nor suggested by Asakura in view of Kato. Nor do Mizuno, Verdiell, and Sidorin remedy the deficiencies of the first two references. Therefore, a prima facie case of obviousness cannot be maintained with regard to claim 13.

Claims 14-18 depend from claim 13 and thus incorporate the features recited therein. These claims are thus also distinct for their incorporation of the features in the independent claim as well as for their separately recited patentably distinct features.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 13-18 under 35 U.S.C. § 103(a) as being unpatentable over Asakura in view of Kato, Mizuno, Verdiell and Sidorin.

CONCLUSION

In view of the foregoing arguments, all claims are believed to be in condition for allowance. If any further issues remain, the Examiner is invited to telephone the undersigned to resolve them.

This response is believed to be a complete response to the Office Action. However, Applicant reserve the right to set forth further arguments supporting the patentability of their claims, including the separate patentability of the dependent claims not explicitly addressed herein, in future papers. Further, for any instances in which the Examiner took Official Notice in the Office Action, Applicant expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 C.F.R. § 1.104(d)(2) and MPEP § 2144.03.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. SON-3163, from which the undersigned is authorized to draw.

Dated: October 21, 2009

Respectfully submitted,

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